

Measurements of Middle Atmospheric Ozone by the ATMOS Experiment

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The Atmospheric Trace Molecule Spectroscopy (ATMOS) Experiment obtained vertical profile measurements of ozone during the Atmospheric Laboratory for Science and Applications (ATLAS-1) shuttle mission in 1992. Comparisons of ATMOS ozone profiles with those from other experiments have been made as an important step in validating the analysis procedures adopted by this experiment. Spatial and temporal coincidences between ATMOS observations and measurements made by other experiments provide a useful comparison. ATMOS profiles are obtained from infrared limb spectra and comparisons with methods that utilize a different spectral region and different retrieval methods allows for a realistic comparison of results and methods. In particular, the stratospheric aerosols from the Mt. Pinatubo eruption in 1991 represent a two-fold problem for remote sensing experiments: introducing unusual perturbations in the composition of the middle atmosphere and altering the transmission of the atmosphere sufficiently to systematically bias measurements.

The comparison has led to some revision in the analysis techniques, when large differences were noticed. The residual differences appear to reflect the variability present in the atmosphere that is introduced in the definition of a coincident measurement and indicate the essential robustness and compatibility of infrared, visible, and ultraviolet measurements of ozone.

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